SLIDE 1:TOOLS AND TEST GEAR FOR AMATEUR RADIO
SOME THINGS THAT ARE NECESSARY, SOME THINGS THAT ARE NICE TO HAVE, AND SOME LUXURIES FOR THE REALLY TOP NOTCH SHOP
SLIDE 2:This is the soldering iron I use at home. It is connected to a soldering station for temperature control but units without temp control can also be used quite easily. Here it pays to buy good quality as you will be using this tool quite often
SLIDE 3:This is the smallest soldering Gun that can be used to solder coax connectors successfully. It has a 140 watt rating on High Power. Note that the high power setting is obtained with the first stage of the trigger. The power drops to 100 watts if you pull the trigger all the way back. If you can find a 200 watt gun or higher get it.
SLIDE 4:Here are two different tools both called “needlenose pliers”. The one on the left will give you more grip and the one on the right will fit into tighter areas.
SLIDE 5:Three different sizes of diagonal cutters. Save the big ones for big wire like 10 or 12 gauge and use the smaller ones for lighter gauge stuff. Here again it pays to pay for quality. An easy test is to look at a light source (lamp, window in daylight, etc) and check for light coming through the closed jaws of the tool. If you see light, put it back, you want a tool where the jaws fit precisely.
SLIDE 6:One can strip some wires with diagonal cutters, but it takes practice. A better choice is a dedicated set of wire strippers like these. Again quality rules but these are not that expensive and are available at any big home improvement store.
SLIDE 7:SCREWDRIVERS Probably one of the tools you already have in the house. Here are two different sets. On the Left is a combo of typical household screwdrivers, the orange one at the top is a multi-tip unit. On the Right is a set of much smaller drivers that are suitable for the small screws that hold many of our radios together.
SLIDE 8:Electric drills are found almost in every home. The trick for us is to find one that will handle drill bits all the way from #60 (very small) up to 3/8” This one is equipped with a quick release chuck because I do most of my drilling with step drills. It does have the ability to remove the quick release chuck and use regular drills as well.

SLIDE 9:Speaking of drill bits here are the ones I use most often. On the Left is a set that I purchased from Harbor Freight which I find good enough for my purposes. On the Right is a set of step drills, also from Harbor Freight. They are cheap and don't last too long but the price for the good ones from Craftsman which also wear out almost as fast, is 5 to 8 times the price for these. Buy the cheap ones and replace them when they wear out in 6 months.
SLIDE 10:Another tool that is probably best to buy at Harbor Freight or a similar store. When you need a file, you need it now, but you will probably not use it often enough to justify the difference in price. If you do, then by all means buy the quality brand. I still have not reached that point yet.
SLIDE 11:This is a nibbling tool. You can start from an edge or drill a pilot hole large enough to accept the small cutter head on the right side of the tool shown here. This tool allows one to create square or rectangular hole in sheet metal or relatively thin plastic. I use it to create the holes for RJ-45 or RJ-12 jacks. Not too expensive and available even from RadioShack.
SLIDE 12:Tools from around the house. You will need these from time to time but unless the use goes up dramatically, I would not bother with a separate set for the radio shop. I used the white ruler as an example because my other ruler is clear and does not show up well. You will probably use the tape measure much more often.
SLIDE 13:SOLDER SUCKER. I prefer this to solder wick which is much less accurate in removing solder placed in error. Available at Radio Shack, Sarasota electronics and elsewhere. This unit is cocked by pressing the button at far right down to the left in this photo. The white tip is then placed over the solder you want to remove and the small button in the middle is pressed to release the plunger.
SLIDE 14:I have a couple of different sets of nut drivers. This is the better set. The other set from Harbor Freight is also fine, but I got these as a Christmas present some years ago. The one limitation is that they do not accommodate long bolts when you are trying to tighten a nut on the bolt. There are ¼" drive deep sockets that will accommodate longer bolts if you need that ability.

SLIDE 15:TOOLS FROM THE GARAGE: There are a few tools that will make the transition from the mechanic's tool box to the radio room. Adjustable wrenches come in several different sizes, as do Vice-grip pliers and Channelock pliers.
SLIDE 16:ELECTRICAL TAPE. While the insulating use of tape has been largely overtaken by heat shrink tubing, electrical tape in different colors like the red, white and black shown here can be used to identify coax runs. A Sharpie pen can be used to write on tape wrapped around coax to further identify it by Antenna or Length or Radio.
SLIDE 17:Speaking of Heat Shrink Tubing, here are several different sizes of the stuff. It comes in sizes down to 1/16" diameter and up to several inches across. Both are pre-shrinking sizes. Just remember to wait for the solder joint to cool before sliding the heat shrink over it. Also remember to put the heatshrink on the wire before you solder the connection. Don't ask me how I know.
SLIDE 18:The ubiquitous Multimeter. These come in digital and analog form, but I prefer the digital form like this Fluke unit. Prices range from less than $5 to several hundred. Unless you work in the space or nuclear industries I would suggest that you spend only what you can afford easily as the accuracy of the expensive units is unneeded in our level of the hobby. The one I use most at home cost me less than $10.
SLIDE 19:The SWR Meter. Probably the most mis-understood device in the hobby. This unit measures up to 300 watts from 160 meters to over 2meters. Others can do 1.25 meters and 70 centimeters. Wattage rating vary widely from 5 watts (Usable only for CBs or QRP HF) to 2 to 300 watts. The professional broadcasters have SWR meters and dummy loads that can go to multi-kilowatt ratings but we do not need that rating so far.
SLIDE 20: ANTENNA ANALYZER: There are now several different analyzers on the market. The price makes this a tool one might want to borrow at first. Some clubs have even purchased a unit to loan out to their members when needed.
SLIDE 21:FREQUENCY COUNTER: This is an instrument that probably will not be used actively too much but at a price of $120 and up makes buying one a sort of affordable proposition. There is a $50 unit out there but my experience with it is that unless it is

placed touching the antenna it cannot hear diddly. The two pictures here demonstrate the lower end on the left and the upper end on the right. Oddly, because the fancier unit was purchased used at a hamfest it actually cost less than the one on the left. Of course it is not portable like the MFJ unit.
SLIDE 22:OSCILLOSCOPE: If you build a lot of kits or homebrew radio designs, this is nice to have. They come in analog (like this one) or digital format. You can even find apps for your laptop or desktop which will turn them into a scope. There may even be an app fort your smart phone. Prices can lead to intense sticker shock but you can usually find one or more at a hamfest. Be cautious, repairing or restoring a scope is expensive and once you get inside the enclosure, quite dangerous. Lethal voltages are present inside the box.
SLIDE 23:SIGNAL GENERATOR: Signal generators are handy for checking the accuracy of your receiver but the cost/benefit ratio would suggest that unless you do a lot of repair or construction work in your shop you will not use it often.
SLIDE 24:SPECTRUM ANALYZER: Spectrum analyzers are sort of like oscilloscopes except they measure the signal against frequency whereas the scope measures it against time. The training required to properly use a spectrum analyzer and the cost of the unit (several thousand dollars) relegate the unit to the professional shopand the rare ham who needs one at home.
SLIDE 25:THE ARRL HANDBOOK: Found on many professional engineer’s desks all over the world, as well as many amateur radio operators. This is the bible when it comes to how to design, build, and troubleshoot almost anything electronic in nature. Updated yearly, it is probably time for me to buy a 2016 issue.
SLIDE 26:THANK YOU VERY MUCH
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GEOFF HAINES, N1GY